

axis of the Cascade Range in southern Oregon. Its one hundred square miles embrace coniferous forests, moist meadows, timberline conditions, pumice "deserts," sheltered canyon bottoms and the precipitous rocky cliffs of the Rim. Species characteristic of the Transition, Canadian and Hudsonian life zones all occur within its limits, and the thousand-foot walls of the caldera in which Crater Lake lies, present remarkable instances of zonal nonconformity.

Because of the position of the area and its diverse habitats, migration lanes have been open from the Columbia plateau, the humid region to the west of the Cascades, and the ancient Klamath-Siskiyou mountain mass lying to the south. The catalogue includes a total of some 570 species and subspecific entities from within the boundaries of the park, of which about a dozen are thought to be endemic. The list is based primarily upon the author's own collections. Of these, one set is preserved in the Dudley Herbarium of Stanford University, where it will be permanently available for consultation; a second set is to be housed at Crater Lake.

The introductory portion of the paper includes a brief ecological description of the park, some interesting notes on the author's explorations of its flora and a partial bibliography of pertinent writings. The taxonomic account is equipped with complete but non-technical keys throughout. Each entity (with the exception of the species of *Carex*) is provided with a few descriptive phrases, to facilitate identification, and full details regarding its known localities of occurrence and characteristic habitats.

The author's taxonomic treatment is predominantly conservative, and simple trinomials have been employed to avoid the necessity of either admitting subspecies in some genera and varieties in others, or else of making extensive changes in status to achieve uniformity. The determinations of specialists have afforded some guide posts for the recognition of species in difficult groups, but the paper is entirely Mr. Applegate's own work. He suggests that some name-alterations may be necessary, a prophecy the future will probably confirm, since even one tautonym has slipped into the catalogue.

The writer has not only given an excellent account of the interesting flora of the southern Cascade Range, but has simultaneously provided his native state with its most complete local flora.—L. CONSTANCE.

*Keys to the Phyla of Organisms, including Keys to the Orders of the Plant Kingdom.* By FRED A. BARKLEY. Privately published by the author, and for sale by the Associated Students' Store, Montana State University, Missoula, Montana. Pp. 1-39. November, 1939. \$ .75.

The keys in this publication are especially designed to aid

the student of plant morphology, and from the manner in which they have been compiled they should admirably serve the purpose. The first key, to the phyla of organisms, orients the student as to the organization of the living world, with its four kingdoms (following recent proposals of Dr. Herbert Copeland), eleven divisions, and forty-six phyla. There follow twenty pages of keys to the orders of the various plant phyla. The author states that these keys were assembled especially from the writings of C. E. Bessey and J. H. Schaffner, but the attempt was made to reflect the views of other authorities. The appended glossary and selected bibliography add much to the utility of the work, which has been attractively printed on rag paper with the pages broader than high to facilitate the presentation of the dichotomous keys. This utilitarian compilation deserves a wide popularity among botanists.—D. D. KECK.

*An Illustrated Manual of California Shrubs.* By HOWARD E. McMINN. Pp. 1-689, 175 figs. J. W. Stacey, Inc. San Francisco. 1939. \$5.00.

The prominent place occupied by the shrub in the vegetation of California, throughout the broad expanses of chaparral, the brush associations of the forest floor, the gullies and the sea coast, makes it especially appropriate that this body of plants should receive such an excellent treatment at the hands of one who may well be called a specialist in this type of plant cover. Shrubs comprise about twenty per cent of the seed plants of this area and are so grouped into characteristic associations as to render them a well-defined unit of the flora. It is not to be expected that any author can delimit, to the satisfaction of all, the concept of what constitutes a shrub. Such delimitation must be, by its very nature, somewhat arbitrary. The present work includes all those forms "classified as woody perennials and semi-woody plants except trees and the succulent-stemmed plants of the Cactus Family. About eight hundred species and two hundred varieties of native shrubs, woody vines, subshrubs, woody cushion plants and halfshrubs have been recognized."

The introduction contains a brief statement on the naming of plants, the phylogenetic and ecological bases for classification, a discussion and classification of the shrub areas of California and a concise survey of the gross morphology of seed plants. In the classification of shrub types in the area concerned the following categories are admitted: desert shrub, Great Basin sagebrush, deciduous shrub, chaparral; all of which are termed "formations." The alpine and subalpine shrubs are treated under the heading, "the lesser shrub areas."

There are two separate keys, one to the genera, the other to the families. It is unusual to find the key to genera preceding the key to families; such an arrangement renders the latter key